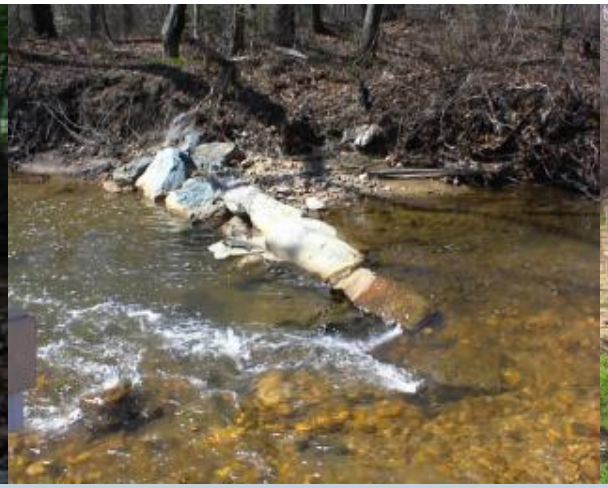
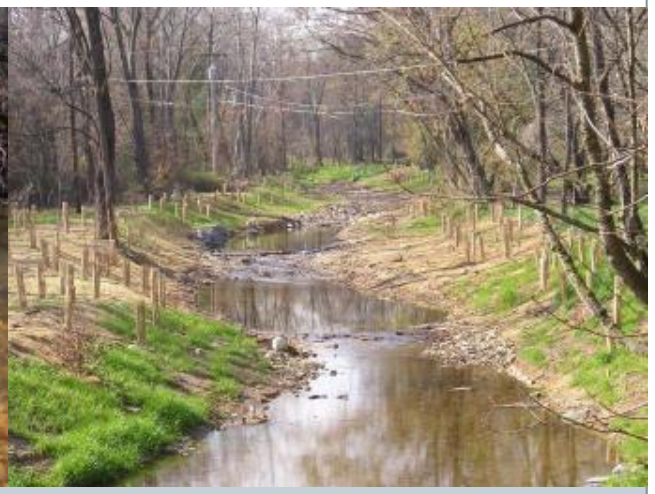
Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects

Presentation at the Joint Meeting of the Urban Stormwater Workgroup, Agricultural Workgroup, and Watershed Technical Workgroup

December 17, 2012

Chesapeake Bay Program
A Watershed Partnership

Stream Restoration is Expected to Increase Substantially to Meet the WIP Targets

Urban Stream Restoration Expected by 2025 in Bay State Phase 2 Watershed Implementation Plans		
State	Urban Stream Restoration	Non-Urban Stream Restoration
	Linear Feet (Miles)	
Delaware	200 (0.02)	63,202 (12)
District of Columbia	42,240 (8)	0
Maryland	2,092,325 (396)	73,975 (14)
New York	26,500 (5)	337,999 (64)
Pennsylvania	55,000 (10)	529,435 (100)
Virginia	116,399 (22)	104,528 (20)
West Virginia	0	19,618 (3.7)
TOTAL	441 miles	214 miles

[1] Acres under urban and non urban stream restoration in each state by 2025 as reported in the Phase 2 Watershed Implementation Plan submissions to EPA in 2012, as summarized in May and July 2012 spreadsheets provided by Jeff Sweeney, EPA CBPO. Totals are inclusive of historical and planned implementation.

Qualifying Conditions

- Stream restoration projects that are primarily designed to protect public infrastructure by bank armoring or rip rap **do not** qualify for a credit.
- The urban stream reach must be greater than 100 feet in length and be still actively enlarging or degrading in response to upstream development or adjustment to previous disturbances in the watershed (e.g., a road crossing).
- The project must utilize a comprehensive approach to stream restoration design, involving the channel and banks.
- Special consideration is given to projects that are explicitly designed to reconnect the stream with its floodplain or create wetlands and/or instream habitat features known to promote nutrient uptake or denitrification.

Environmental Concerns

- Each project must comply with all state and federal permitting requirements, including 404 and 401 permits, which may contain conditions for pre-project assessment and data collection, as well as post construction monitoring.

- Stream restoration is a carefully designed intervention to improve the hydrologic, hydraulic, geomorphic, water quality, and biological condition of degraded urban streams, and cannot and should not be implemented for the sole purpose of nutrient or sediment reduction.

- Urban stream restoration is generally only warranted in urban stream reaches that have been or are currently being degraded by upstream watershed development.

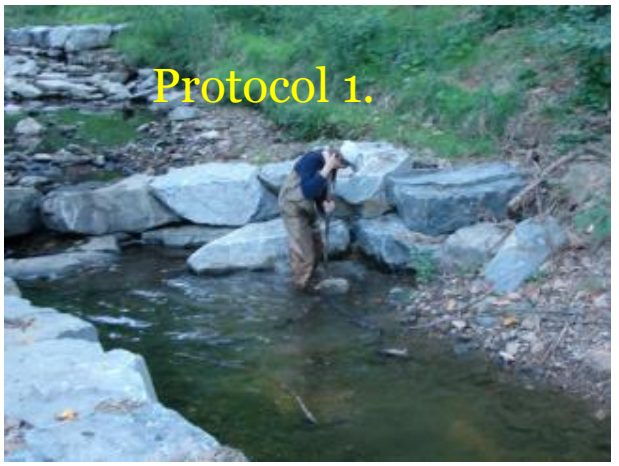
- There may be a few classes of legacy sediment stream restoration projects that do not fall into the preceding statement. Also, there may instances where limited bank stabilization is needed to protect critical public infrastructure (which may need to be mitigated and does not qualify for any sediment or reduction credits).

Environmental Concerns

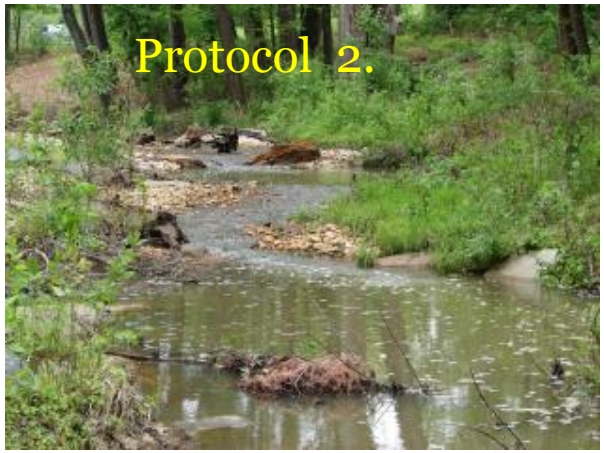
- A qualifying project must meet certain presumptive criteria to ensure that high-functioning portions of the urban stream corridor are not used for in-stream stormwater treatment (i.e., where existing stream quality is still good). These may include one or more of the following:
  - Geomorphic evidence of active stream degradation (i.e., BEHI score)
  - An IBI of fair or worse
  - Hydrologic evidence of floodplain disconnection
  - Evidence of significant depth of legacy sediment in the project reach
- Stream restoration should be directed to areas of more severe stream impairment, and the use and design of a proposed project should also consider the level of degradation, the restoration needs of the stream, and the potential functional uplift.
- Before credits are granted, stream restoration projects will need to meet post-construction monitoring requirements, document successful vegetative establishment, and conduct initial project maintenance.
- A qualifying project must demonstrate that it will maintain or expand riparian vegetation in the stream corridor, and compensate for any project-related tree losses in project work areas.
- All qualifying projects must have a designated authority responsible for development of a project maintenance program that includes routine and long-term maintenance.

Stream Restoration Protocols and Design Examples

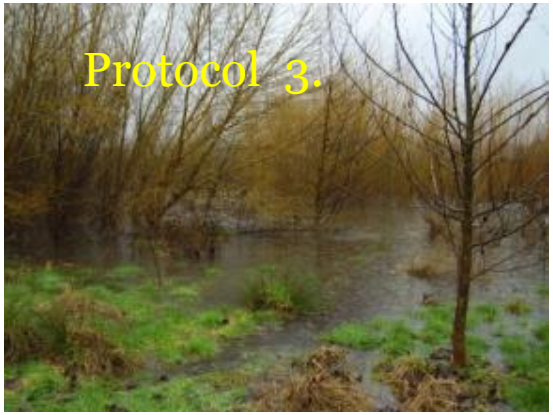
1. Unrestored stream



2. Prevented sediment approach



3. In-stream denitrification



4. Flood plain reconnection

Summary of Stream Restoration Credits for Individual Restoration Projects [1, 2]

No	Name	Units	Pollutants	Method	Reduction Rate
1	Prevented Sediment (S)	Pounds Per Year	Sediment TN,TP	Define Bank Retreat Using BANCS	Measured N/P Content in Stream Sediment
2	Instream Denitrification (B)	Pounds Per Year	TN	Define Hyporheic Box for Reach	Measured Unit Stream Denit Rate
3	Stormflow Floodplain Reconnection (S)	Pounds Per Year	Sediment TN,TP	Use Curves to Define Volume for Reconnection Storm Event	Measured Removal Rates for Floodplain Wetland Restoration Projects
4	Dry Channel RSC as a Retrofit (S/B)	Removal Rate	Sediment TN,TP	Determine Stormwater Treatment Volume	Use Adjustor Curves from Retrofit Expert Panel

[1] Depending on project design, more than one protocol may be applied to each project, and the load reductions are additive.
[2] Sediment load reductions are further reduced by a sediment delivery factor in the CBWM (which is not used in local sediment TMDLs)
S: applies to stormflow conditions
B: applies to base flow or dry weather conditions

Duration of Stream Restoration Credit

- Max duration for the removal credits is 5 years
- Can be renewed based on a field performance inspection that verifies the project still exists, is adequately maintained and operating as designed.
- Duration of the credit is shorter than other structural urban BMPs, as these projects are:
  - subject to catastrophic damage from extreme flood events
  - have requirements for 3 to 5 years of post-construction monitoring to satisfy permit conditions

Typical Reporting Information Includes:

- Type, length and width of stream restoration project
- Location coordinates
- Year of installation and maximum duration of credit
- 12 digit watershed in which it is located
- Protocol(s) used
- Projected sediment, nitrogen, and phosphorus load reduction

Localities should check with their state agency on the specific data to report for individual projects.

Initial Verification of Performance

- Prior to submitting the load reduction to the state tracking database, the installing agency will need to provide a post-construction certification that the stream restoration project:
  - was installed properly,
  - meets or exceeds its functional restoration objectives
  - hydraulically and vegetatively stable,
- Initial verification is provided either by the designer, local inspector or state permit authority

Issues with Applying Urban Protocols to Non-Urban Stream Restoration Projects

- Urban and non-urban streams do differ with respect to their hydrologic stressors, nutrient loadings and geomorphic response.
- Both are subject to the pervasive impact of legacy sediments observed in rural and agricultural watersheds.
- The new urban stream protocols should work well in rural situations, depending on project design parameters (e.g., severity of bank erosion, floodplain reconnection volume, etc.).

Panel recommends that the urban protocols can be applied to non-urban stream restoration projects, if they:

- Are designed using the NCD, LSR or RSC approaches,
- Meet the relevant qualifying conditions, environmental review and verification requirements for urban projects.
- Are adjusted to reflect the actual non-urban load being delivered to the rural project. The appropriate unit area loading rate for each non-urban land use can be directly determined directly from local CAST outputs for the geographic area in which the project is located. In addition, the total load should be used instead of just the load from impervious surfaces.

Some types of non-urban stream restoration projects will not qualify for sediment or nutrient credit including:

- Enhancement projects where the stream is in fair to good condition, but habitat features are added to increase fish production (e.g., trout stream habitat, brook trout restoration, removal of fish barriers, etc.).
- Projects that seek to restore streams damaged by acid mine drainage
- Riparian fencing projects to keep livestock out of streams

Next Steps??

- 30 day comment period until Friday Jan 30
- Policy/permitting comments to relevant work group chairs
- CSN to revise report and go thru the WTWG/WQGIT approval process in Feb